

LIFE HISTORY AND DESCRIPTIONS OF THE IMMATURE
STAGES OF *JAMESOMYIA GEMINATA*
(DIPTERA: TEPHRITIDAE)

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Abstract.—The biology of *Jamesomyia geminata* (Loew) is discussed and the first-, second-, and third-instar larva and puparium are described and illustrated. Its seasonal distribution and relationship to its host plant *Lactuca canadensis* are included.

Jamesomyia was erected by Quisenberry (1949) for one species, *Jamesomyia geminata* (Loew). Quisenberry gave a genus and species description of *J. geminata* along with a record of its distribution.

The general life cycle is presented here, along with descriptions of the immature stages.

Life History

Females were found during July on the host plant (*Lactuca canadensis*) searching for flower buds of the proper size in which to oviposit. The female walked up and down the flower stalks, stopping intermittently to flex its wings. Elongate buds of about 5.5 mm were chosen for oviposition. The female inserted the ovipositor between the bracts at, or near the apex of the flower bud and laid a single egg among the florets.

Males are territorial and were found "patrolling" the upper leaves and flower buds of the host plant. As females came into the males' territory, the male exhibited courtship behavior, using stylized wing and body movements to attract the female. The male extended one wing slowly perpendicular to the body, then the other wing. Sometimes both wings were extended simultaneously. Quick side-ways body movements were also employed in attracting the female.

Larvae require about a month to be fully grown. They feed on the achenes, consuming all but an outer shell of the small number of achenes available (Fig. 7). The uneaten achenes and larval excrement are "glued" together to form a protective "puparium case" in which the mature third-instar larva overwinters. During August the host plant's seeds are dispersed and the puparium case falls to the ground. The mature larva usually pupates the following spring and adults begin emerging the last of June in northeastern Ohio.

Occasionally larvae pupated in August and adults emerged the same season. Whether adults of the second generation used the same species of plant as a host, or did not reproduce, was not determined.

The host plant, *Lactuca canadensis* L., occurred sparsely along old fence rows or the borders of a woods. *Jamesomyia geminata* was also infrequently found.

Of 100 heads of *Lactuca canadensis* examined, 38 contained larvae. Of these, 25% were parasitized by a wasp, *Habrocytus* sp. (Pteromalidae). An anthomyiid fly infested the same flower buds and seemed to be as common as *Jamesomyia geminata*. Occasionally the two species of larvae were found infesting the same head. If there is insufficient food for both larvae, the anthomyiid usually wins the competition. Frequently one of the two species was parasitized by a wasp but never both species.

Descriptions of Immature Stages

Third-instar larva.—Length 2.6–3.1 mm, width 1.4–2.2 mm (Fig. 1). White to light yellow as early third-instar larva, to nearly black, especially 1st and last segments of overwintering larva. Mature larva barrel-shaped, head and 8th abdominal segments dark brown, middle segments yellowish brown. Integument shagreened; no spinule patches on venter. Two irregular rows of strong spinules on dorsum of 6th and 7th abdominal segments, smaller spinules on other segments. Eighteen sensilla distributed around each segment. Pseudocephalic segment invaginated into the thorax. Overwintering larva with scalloped posterior border around 8th abdominal segment, posterior part being greatly darkened.

Anterior spiracles (Fig. 2) fan-shaped, with tubules, dorsal and ventral lobes branched, yellow to light orange. Stigmatic chamber distinctly divided into several cells, 3 across; about 5 lengthwise.

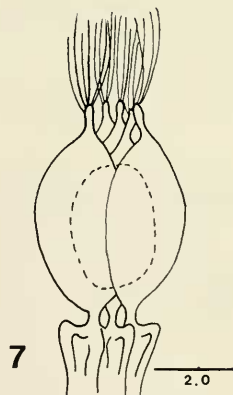
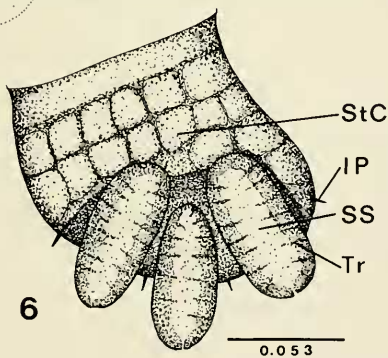
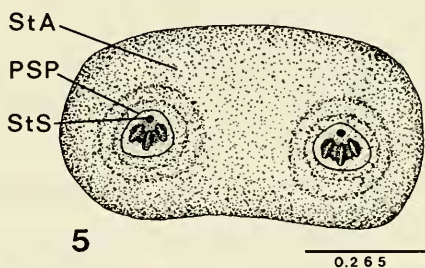
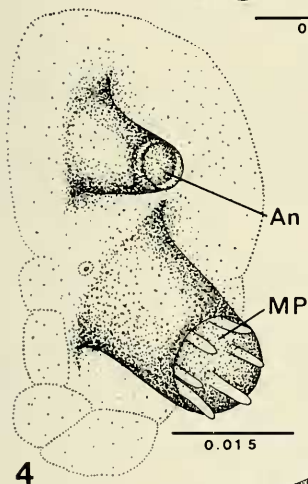
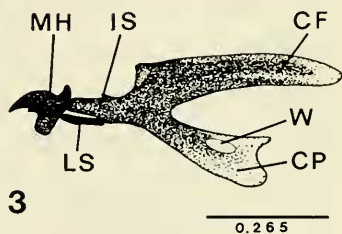
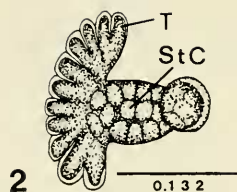
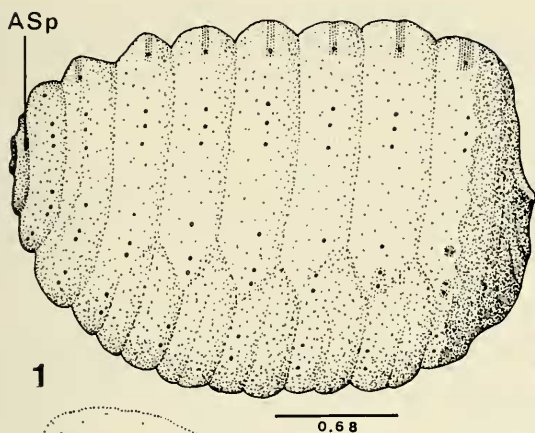
Cephalopharyngeal skeleton (Fig. 3) heavily sclerotized, bearing 1 accessory tooth midway on ventral margin of mouth hooks. Mouth hooks, 0.15 mm long, slightly longer than wide. Intermediate sclerite slightly longer than mouth hooks. Labial sclerite long and narrow. Cibarial phragma dark except distal portion which bears window.

Maxillary palp (Fig. 4) slightly longer than wide, bearing perhaps 5 or 6 short peglike segments distally. Antenna slightly longer and more conical.

Posterior stigmatic disc (Figs. 5, 6) smooth, bearing no lobes or ridges. Posterior stigmatic area dark, slits and stigmatic scar set off by much lighter stigmatic plate. Slits oval with bars extending inward $\frac{1}{3}$ of way from each side, peritremes dark with very small opening at distal end. Slits about 0.056 mm long. Stigmatic chamber distinctly divided into 6 or 7 cells across and

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Figs. 1–7. *Jamesomyia geminata* mature third-instar larva and plant infestation. 1. Larva; ASp, anterior spiracle; 2. Anterior spiracle; StC, stigmatic chamber; T, tubule; 3. Cephalopharyngeal skeleton; CF, clypeofrontal phragma; CP, cibarial phragma;



IS, intermediate sclerite; LS, labial sclerite; MH, mouth hook; W, window; 4. Antenna, An; maxillary palp, MP; 5. Posterior spiracular plate; PSP, posterior spiracular plate; StA, stigmatic area; StS, stigmatic scar; 6. Posterior spiracular plate; IP, interspiracular process; SS, stigmatic slit; StC, stigmatic chamber; Tr, trabeculae; 7. Pupation site among achenes of *Lactuca canadensis*.

3 or 4 deep. Interspiracular processes composed of 4 very small, short spikes, 1 on each side of a slit. Anal plate pale yellow, not shagreened and bearing no tubercles. Anal plate set off ventrally by shagreened area and dorsolaterally on each side by 2 papillae.

Second-instar larva.—Length 1.32–2.38 mm; width 0.61–1.32 mm. White to pale yellow, anterior end pointed, posterior end rounded. Integument not shagreened but spinules present as in third instar except no strong spinules on 6th and 7th abdominal segments. Anterior spiracles lighter in color and bear the same number of tubules as in third instar.

Posterior spiracular disc light yellow. Slits about 0.024 mm long.

Cephalopharyngeal skeleton dark except for lighter area at point of mouth hooks and distal ends of clypeofrontal and cibarial phragmata. Mouth hooks (about 0.1 mm) slightly longer than intermediate sclerite. No window in cibarial phragma.

First-instar larva.—Length 0.8–1.5 mm; width 0.4–0.61 mm. Mouth hooks and intermediate sclerite light brown, clypeofrontal phragma large and dark, cibarial phragma lighter and smaller. No labial sclerites; labial sclerite fused to intermediate sclerite. Mouth hooks about 0.018 mm long. No anterior spiracles. Two barely visible oval slits, which are only slightly pigmented, represent the posterior spiracles.

Egg.—Length 1.18–1.27 mm; width 0.24–0.27 mm. Dull white, micropylar end lanceolate, opposite end more rounded. No noticeable reticulation or other markings.

Puparium.—Length 3.45 mm; width 1.86 mm. Barrel-shaped, ends truncate as in third-instar larva. Puparium very thin and dark; black at ends; center dark brown. Anterior spiracles slightly raised; tubules as in third-instar larva. Posterior spiracular plates only very slightly raised. Spinules, when visible, as in third-instar larva.

Literature Cited

- Quisenberry, B. F. 1949. A new genus of Tephritidae near *Xanthomyia* (Diptera). Bull. Brooklyn Entomol. Soc. 44:49–52.

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